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PART III, SECTION 4

TELECOM REGULATORY AUTHORITY OF INDIA

NOTIFICATION

NEW DELHI, THE xxth July, 2012

F. No. 305-12/2012-QoS.—In exercise of the powers conferred by section 36 read with sub-clauses (i) and (v) of clause (b) of sub-section (1) of section 11 of the Telecom Regulatory Authority of India Act, 1997 (24 of 1997), the Telecom Regulatory Authority of India hereby makes the following regulations, namely: -

**THE STANDARDS OF QUALITY OF SERVICE FOR MOBILE DATA
SERVICES REGULATIONS, 2012**

(-- OF 2012)

SECTION I

PRELIMINARY

1. Short title, commencement and application. — (1) These regulations may be called the Standards of Quality of Service for Mobile Data Services Regulations, 2012.

(2) They shall come into force with effect from the 1st day of xxxx, 2012.

(3) These regulations shall apply to ----

all service providers [including Bharat Sanchar Nigam Limited and Mahanagar Telephone Nigam Limited, being the companies registered under the Companies Act, 1956 (1 of 1956)] providing,--

(i) Unified Access Services;

(ii) Cellular Mobile Telephone Service;

2. Definitions.— In these regulations, unless the context otherwise requires,-

(a) **“Act”** means the Telecom Regulatory Authority of India Act, 1997 (24 of 1997);

(b) **“Authority”** means the Telecom Regulatory Authority of India established under sub-section (1) of section 3 of the Act;

(c) **“Cell”** means the radio frequency coverage area of a site in radio access network which is part of a cellular mobile telephone network and ---

(i) in case it is an omni-site, it is synonymous with the site; and

(ii) at a sectored site, it is synonymous with the sector;

(d) **“Cellular Mobile Telephone Service”** -

(i) means telecommunication service provided by means of a telecommunication system for the conveyance of messages through the agency of wireless telegraphy where every message that is conveyed thereby has been, or is to be, conveyed by means of a telecommunication system which is designed or adapted to be capable of being used while in motion;

(ii) refers to transmission of voice or non-voice messages over Licensee's Network in real time only but service does not cover broadcasting of any messages, voice or non-voice, however, Cell Broadcast is permitted only to the subscribers of the service;

(iii) in respect of which the subscriber (all types, pre-paid as well as post-paid) has to be registered and authenticated at the network point of registration and approved numbering plan shall be applicable;

(iv) includes access service provided through Global System for

Mobile Communications (GSM) and Code Division Multiple Access (CDMA) technologies and any other technologies permitted under the licence agreements for the Cellular Mobile Telephone Service and the Unified Access Service;

(e) "**consumer**" means a consumer of a service provider falling in sub-regulation (3) of regulation 1 and includes its customer and subscriber;

(f) "**latency**" means the time taken by a packet to reach the receiving endpoint after being transmitted from the sending endpoint;

(g) "**licence**" means a licence granted or having effect as if granted under section 4 of the Indian Telegraph Act, 1885 (13 of 1885) or the provisions of the Indian Wireless Telegraphy Act, 1933 (17 of 1933);

(h) "**licensee**" means any person licensed under sub-section (1) of section 4 of the Indian Telegraph Act, 1885 (13 of 1885) for providing specified public telecommunication services;

(i) "**message**" shall have the same meaning assigned to it in clause (3) of section 3 of the Indian Telegraph Act, 1885 (13 of 1885);

(j) "**MTTR**" means Mean Time to Repair;

(k) "**Node B**" means a logical node responsible for radio transmission or reception in a cell to or from the user equipment;

(l) "**OMC**" means Operation and Maintenance Centre;

(m) "**Packet Data Protocol context**" or "**PDP context**" means access to an external packet-switching network which contains information such as the type of packet-switching network, the Mobile Station PDP address (IP address), the reference of Gateway GPRS Support Node and the requested quality of service;

(n) "**Quality of Service**" is the main indicator of the performance of a telecommunication network and of the degree to which such network conforms to the standards of such quality of service as specified in

these regulations for specified parameters;

(o) **“Radio Access Bearer”** or **“RAB”** means, a service provided by the Access Stratum to the Non-Access Stratum for the transfer of user data between the user equipment and the Core Network;

(p) **“Radio interface”** means the interface between user equipment and the Universal Terrestrial Radio Access Network access point, which encompasses all the functionality required to maintain such interfaces;

(q) **“Radio Resource Control”** or **“RRC”** means a sub layer of radio interface Layer 3 existing in the control plane only which provides information transfer service to the Non-Access Stratum and is responsible for controlling the configuration of radio interface Layers 1 and 2;

(r) **“regulations”** means the Standards of Quality of Service for Mobile Data Services Regulations, 2012;

(s) **“service provider”** means any service provider to which these regulations apply;

(t) **“telecommunication services”** means service of any description (including electronic mail, voice mail, data services, audio-tex services, video-tex services, radio paging and cellular mobile telephone services) which is made available to users by means of any transmission or reception of signs, signals, writing images, and sounds or intelligence of any nature, by wire, radio, visual or other electro- magnetic means but shall not include broadcasting services;

(u) **“throughput”** means an amount of user information transferred in a network within a defined time period;

(v) **“Time Consistent Busy Hour”** or **“TCBH”** means the one hour period starting at the same time each day for which the average traffic of the resource group concerned is greatest over the days under consideration and such Time Consistent Busy Hour shall be established on the basis of analysis of traffic data for a period of ninety

days;

(w) **“Unified Access Services”** -

(i) means telecommunication service provided by means of a telecommunication system for the conveyance of messages through the agency of wired or wireless telegraphy;

(ii) refers to transmission of voice or non-voice messages over Licensee's Network in real time only but service does not cover broadcasting of any messages, voice or non-voice, except, Cell Broadcast which is permitted only to the subscribers of the service;

(iii) in respect of which the subscriber (all types, pre-paid as well as post-paid) has to be registered and authenticated at the network point of registration and approved numbering plan shall be applicable;

(x) all other words and expressions used but not defined in these regulations and defined in the Act and the rules and other regulations made thereunder shall have the meanings respectively assigned to them in the Act or the rules or the regulations, as the case may be.

SECTION II

QUALITY OF SERVICE PARAMETERS FOR MOBILE DATA SERVICES

3. Quality of Service parameters for mobile data services.—(1) Every Cellular Mobile Telephone Service provider or Unified Access Services provider shall meet the following Quality of Service benchmarks for the mobile data services in respect of each specified parameter, namely:-

Serial Number	Name of Parameter	Benchmarks
3.1	Service Activation / Provisioning	Within 3hrs with 95% success rate.
3.2	Successful data transmission download attempts	>90%
3.3	Successful data transmission upload attempts	>85%
3.4	Minimum download speed	To be measured by the service provider and reported to TRAI.
3.5	Average Throughput for Packet data	>90% of the subscribed speed
3.6	Percentage of Node B/ BTS carrying less than 80% of the average throughput in a license service area	< 10%
3.7	Latency	Audio < 150ms; Video <100ms Data < 250ms; Data (interactive) <75ms
3.8	PDP Context Activation Success Rate	≥95%
3.9	Drop rate	≤2%

(2) The Authority may, from time to time, through audit and objective assessment of quality of service conducted either by its own officers or employees or through an agency appointed by it, verify and assess the performance of the service provider with respect to the Quality of Service benchmarks for the mobile data services specified in sub-regulation (1).

SECTION III

RECORD KEEPING, REPORTING AND PUBLICATION OF QUALITY OF SERVICE PERFORMANCE

4. Record Keeping.—(1) Every service provider shall maintain documented process of collection of data for each Quality of Service parameter specified by the Authority in regulation 3 and submit to the Authority, within sixty days of notification of these regulations, the documented process of collection of data of each Quality of Service parameter indicating the correlation with the primary data which are derived from system counters or codes in Operation and Maintenance Centre or Network Management System or Mobile Switching Centre or telephone exchange, along with record keeping procedure.

(2) Every service provider shall maintain complete and accurate records of its compliance of benchmark of each Quality of Service parameter specified in regulations 3 in such manner and in such formats as may be specified by the Authority by order or direction issued from time to time.

(3) The Authority may, from time to time, either by order or by direction, specify uniform record keeping procedures and formats, including guidelines on measurement methodology for various Quality of Service parameters specified in these regulations.

(4) The Authority may, if it considers it expedient so to do, at any time, direct any of its officers or employees or an agency appointed by the Authority to inspect the records maintained under sub-regulations (2) and (3) or to get such records audited.

(5) The Authority may, if it considers it expedient so to do, require the service provider to get the records maintained by it under sub-regulations (2) and (3) audited through an agency, as may be specified by the Authority and submit the report in respect of such audit to the

Authority and the cost of such audit shall be borne by the service provider.

5. Reporting.—Every service provider shall submit to the Authority its compliance reports of benchmarks in respect of each Quality of Service parameter specified under regulation 3 in such manner and format, at such periodic intervals and within such time limit as may be specified by the Authority, from time to time, by an order or direction.

6. Publication.—(1) The Authority may publish, in such manner and in such format, as may be decided by it from time to time ----

(a) the compliance reports of benchmarks of each Quality of Service parameter reported to it by the service providers under regulation 5;

(b) the results of the audit and objective assessment of the Quality of Service undertaken by the Authority or its authorized agency as per sub-regulation (2) of regulation 3 -----

through its website or through press releases or through advertisements in the newspapers, for the information of the general public.

(2) Every service provider shall publish, for the information of the consumers, its performance with respect to the benchmark of Quality of Service parameter specified in regulation 3, in such manner and in such format, as may be directed by the Authority from time to time.

7. Review.—(1) The Quality of Service parameters specified in regulation 3 may be reviewed by the Authority from time to time.

(2) The Authority, on reference from any affected party for good and sufficient reasons, may review and modify these regulations.

8. Quality of Service Parameter in the licence.—Wherever higher quality of service parameter has been stipulated as a condition of

licence, the service provider shall meet such quality of service parameters contained in the licence.

9. Interpretation.— In case of any doubt regarding interpretation of any of the provisions of these regulations, the clarification issued by the Authority shall be final and binding.

(Rajeev Agrawal)

Secretary

Note – The Explanatory Memorandum explains the objects and reasons including measurement methodology for various Quality of Service parameters of the “Standards of Quality of service for mobile data services, Regulations, 2012(.of 2012)”.

Explanatory Memorandum to the “Standards of Quality of Service for Mobile Data Services Regulations, 2012” (...of 2012) dated the XXth July, 2012

1. BACKGROUND:

1.1 Section 11 (1) (b) (v) of the TRAI Act 1997 mandates the Telecom Regulatory Authority (TRAI) to “lay down the standards of quality of service to be provided by the service providers and ensure the quality of service and conduct the periodical survey of such service provided by the service providers so as to protect interest of the consumers of telecommunication services”. In order to

- (i) create conditions for customer satisfaction by making known the quality of service which the service provider is required to provide and the user has a right to expect;
- (ii) measure the Quality of Service provided by the Service Providers from time to time and to compare them with the norms so as to assess the level of performance; and
- (iii) to generally protect the interests of consumers of telecommunication services,

The Authority, in exercise of its functions under the above provisions in the TRAI Act, had notified the “Quality of Services of Broadband Service Regulations, 2000” on 6th of October, 2006. These regulations provide for benchmarks for the various Quality of Service parameters for Broadband services. The benchmarks provided in these regulations are applicable for Broadband services provided through wire line connections. TRAI has also laid down the Quality of Service Standards for dial-up and leased line internet access through the Regulation on Quality of Service Dial-Up and Leased Line Internet Access Service, 2001 dated 10th December, 2001.

1.2 With the roll out of 3G and Broadband Wireless Access (BWA) services, the growth rate in cellular mobile telephone service is poised for higher growth, compared to wire line internet users. Presently, there is no quality of service standards for the mobile data services. It is necessary to benchmark and monitor the quality of service offered by the service

providers of mobile data services with various options open to the implementing agencies so that the interests of consumers are protected. The Authority, therefore, decided to benchmark the quality of service parameters for mobile data services.

2. The QoS parameters:

2.1 Service activation/ provisioning:

This refers to service activation and involves programming various network databases with the customer's information, for various technologies permitted under the license networks of an existing customer.

2.2 Successful data transmission download attempts:

The successful data download attempts is defined as the ratio of successful data downloads to the total number of data download attempts in a specified time period. A data transmission is successful if a test file is downloaded completely and with no errors.

2.3 Successful data transmission upload attempts:

The successful data upload attempts is defined as the ratio of successful data uploads to the total number of data upload attempts in a specified time period. A data upload is successful if a test file is uploaded completely and with no errors.

2.4 Minimum download speed:

The download speed is defined as the data transmission rate that is achieved separately for downloading a specified test file from a test server to a user's device.

This parameter is to be measured and reported to TRAI for all the mobile data services or technologies.

2.5 Average Throughput for Packet data:

It is defined as the average rate at which packets are transmitted in a network. The service providers need to constantly upgrade their network to meet average throughput benchmark.

The service provider will advertise the throughput being offered to its customers as per their category or plan.

2.6 Percentage of Node B/ BTS carrying less than 80% of the average throughput in a license service area:

The throughput available to a customer will depend on the number of users served by a BTS/Node B. In case the number of users is more the throughput may be less. In many cases the throughput is affected due to limitations in the backhaul like less number of E1s connecting Node B to RNCs/ BTS to BSCs etc. The operators may have to augment this to maintain certain level of throughput. As such, it is necessary to measure the average throughput during TCBH for Node B/ BTS in the licensed service area. The average throughput for Node B/ BTS can be averaged over a period of one month and subsequently average throughput per Node B for the licensed service area for a month period may be calculated.

2.7 Latency:

Latency is the amount of time taken by a packet to reach the receiving endpoint after being transmitted from the sending endpoint. This time period is termed the "end-to-end delay" occurring along the transmission path.

2.8 PDP Context Activation Success Rate:

A Packet Data Protocol (PDP) context specifies access to an external packet-switching network. The successful PDP context activation is defined as the ratio of successful PDP context activation to the total number of PDP context activation attempts in a specified time period.

2.9 Drop Rate:

It measures the inability of Network to maintain a connection and is defined as the ratio of abnormal disconnects w.r.t. all disconnects (both normal and abnormal). An abnormal disconnect may happen because of Radio Link Failures, Uplink (UL) or Downlink (DL) interference, bad coverage, unsuccessful handovers or any other reason.